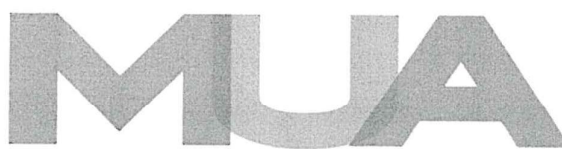


The
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UNDERGRADUATE UNIVERSITY EXAMINATIONS

SCHOOL OF MANAGEMENT AND LEADERSHIP

**DEGREE OF BACHELOR OF COMMERCE/ MANAGEMENT AND
LEADERSHIP**

BCM 112/BML 103 : BUSINESS MATHEMATICS

DATE: 4th DECEMBER 2014

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.
7. Write all your answers in the Examination answer booklet provided.

QUESTION ONE

- a) Compare and contrast between Laspeyre and Paasche Price indices

(4 marks)

- b) Find the nature of the turning points on the curve represented by the following function

$$y = x^3 - 27x + 35$$

(5 marks)

- c) Solve the following set of simultaneous equation using matrix method

(4 marks)

$$3x + 4y = 10$$

$$2x + 7y = 11$$

- d) Using separate Venn diagram represents the following sets: given

$$V = \{a, b, c, d, e, f, g, h\}$$

$$A = \{b, c, d\}$$

$$B = \{d, e, f\}$$

i) $A \cup B$

ii) $A \cap B$

iii) $A \cap B^c$

iv) $(A \cup B)^c$

(12 marks)

QUESTION TWO

Explain the following sampling techniques

(15 marks)

- i) Stratified sampling
- ii) Multistage sampling
- iii) Quota sampling
- iv) Simple random sampling
- v) Systematic sampling

QUESTION THREE

- a) From the following data relating to working class consumer price index of Nairobi City, calculate index number for 2011 taking 2010 as the base

(11 marks)

| Group | Group Indices | | |
|---------------|---------------|------|------|
| | Weight | 2010 | 2011 |
| Food | 48 | 110 | 130 |
| Clothing | 8 | 120 | 125 |
| Fuel | 7 | 110 | 120 |
| Rent | 13 | 100 | 100 |
| Miscellaneous | 14 | 115 | 135 |

- b) Evaluate

(4 marks)

$$\int_2^5 (10x^3 + 4x - 1) dx$$

QUESTION FOUR

The distributions of monthly income per family are as shown below:

| Monthly income | Cumulative frequencies |
|----------------|------------------------|
| 80 - 120 | 30 |
| 120 - 160 | 55 |
| 160 - 200 | 75 |
| 200 - 240 | 90 |
| 240 - 280 | 100 |

Required to find:

- i) The mean monthly income **(4 marks)**
- ii) The standard deviation **(9 marks)**
- iii) Coefficient of variation **(2 marks)**

QUESTION FIVE

- a) State the advantages of using tables as a means of presenting data

(4 marks)

- b) A number of families were measured by the number of children to give the following frequency distribution:

| | | | | | | |
|------------------|----|----|----|---|---|-----------|
| No. of children: | 0 | 1 | 2 | 3 | 4 | 5 or more |
| No. of families: | 12 | 28 | 22 | 8 | 2 | 2 |

Use this information to calculate the probability that another family of this type will have:

- (i) 2 children (2 marks)
- (ii) 3 or more children (2 marks)
- (iii) Less than 2 children (2 marks)

c) Let $A = \begin{pmatrix} 2 & 1 \\ 3 & 0 \\ 4 & 2 \end{pmatrix}$

And $B = \begin{pmatrix} 1 & -1 & 4 \\ 2 & 0 & 5 \end{pmatrix}$

Find $|C| = A \times B$ and show that C is a singular matrix (5 marks)

QUESTION SIX

- a) Solve the following equation using quadratic root formula (6 marks)

$$\frac{X-3}{X} = \frac{2X+1}{X-1}$$

- b) Highlight any 5 limitations of index numbers (5 marks)

- c) Distinguish between (4 marks)

- i) Discrete variables and continuous variables
- ii) Census and survey